

Amendments to the Claims

This listing of claims will replace the originally filed claims in the application.

Listing of Claims:

Claims 1 – 14 (cancelled).

Claim 15 (new): A method which may be used for rapidly cooling metal parts with a pressurized cooling gas mixture, wherein:

- a) said mixture comprises at least one infrared radiation absorbing gas; and
- b) said mixture has convective heat transfer properties superior to those of nitrogen in similar cooling conditions.

Claim 16 (new): The method of claim 15, wherein said mixture further comprises an additive gas, wherein said additive gas comprises at least one member selected from the group consisting of:

- a) helium;
- b) hydrogen; and
- c) mixtures thereof.

Claim 17 (new): The method of claim 15, wherein said mixture further comprises a supplementary gas.

Claim 18 (new): The method of claim 16, further comprising adjusting the composition of said mixture to obtain an average mixture density substantially equal to that of nitrogen.

Claim 19 (new): The method of claim 16, further comprising adjusting the composition of said mixture to optimize said mixture's convective heat transfer coefficient, as compared to the individual convective heat transfer coefficients of each component of said mixture.

Claim 20 (new): The method of claim 16, further comprising:

- a) cooling said parts in a vessel, wherein said vessel comprises a gas stirring system; and
- b) adjusting the composition of said mixture to obtain an average density of said mixture which is capable of being stirred by said stirring system, without having to make significant changes to said vessel.

Claim 21 (new): The method of claim 16, further comprising adjusting the composition of said mixture so that endothermic chemical reactions can occur between said absorbing gas and at least one other component of said mixture.

Claim 22 (new): The method of claim 16, wherein said absorbing gas comprises CO₂.

Claim 23 (new): The method of claim 15, wherein said absorbing gas comprises at least one member selected from the group consisting of:

- a) saturated hydrocarbons;
- b) unsaturated hydrocarbons;
- c) CO;
- d) H₂O;
- e) NH₃;
- f) NO;
- g) N₂O;
- h) NO₂; and
- i) mixtures thereof.

Claim 24 (new): The method of claim 15, wherein the content of said absorbing gas in said mixture is between about 5% to about 100% of the total mixture volume.

Claim 25 (new): The method of claim 24, wherein said content is between about 20% to about 80%.

Claim 26 (new): The method of claim 15, wherein said gas mixture comprises a binary CO₂/He mixture, wherein the CO₂ content of said mixture is between about 20% to about 80% of the total mixture volume.

Claim 27 (new): The method of claim 15, wherein said gas mixture comprises a binary CO₂/H₂ mixture, wherein the CO₂ content of said mixture is between about 20% to about 80% of the total mixture volume.

Claim 28 (new): The method of claim 15, further comprising recycling said mixture wherein said recycling comprises:

- a) recompressing said mixture prior to a subsequent use; and

- b) processing said mixture to recover at least one component of said mixture, wherein said processing comprises at least one process selected from the group consisting of:
 - 1) separating; and
 - 2) purifying.

Claim 29 (new): A method which may be used for rapidly cooling metal parts with a pressurized cooling gas in an apparatus, said method comprising:

- a) cooling said parts with said cooling gas, wherein said cooling gas comprises:
 - 1) about 20% to about 80%, of the total cooling gas volume, of an infrared absorbing gas; and
 - 2) about 80% to about 20%, of the total cooling gas volume, of a second gas, wherein said second gas comprises at least one member selected from the group consisting of:
 - i) hydrogen;
 - ii) helium; and
 - iii) mixtures thereof; and
- b) adjusting the composition of said cooling gas so that significant later changes to said apparatus are unnecessary.